ATLANTIC TESTING LABORATORIES, LIMITED

atl

Box 29
Canton, N.Y. 13617
(315) 386-4578

Box 356
Cicero, N.Y. 13039
(315) 699-5281

August 31, 1989

U.S. Army Engineering Division, New England
424 Trapelo Road
Waltham, MA 02254-9149

Attn: Chief, Engineering Division

Re: Delivery Order No. 0010
Cape Cod Canal, Massachusetts
ATL Project No. CD036-89

Gentlemen:

The original report for the referenced project is enclosed for your review.

By copy of this letter, we are transmitting two copies of this report to the Chief, Geotechnical Engineering Branch, NEDED-G.

Sincerely,

Spencer F. Thew, P.E./L.S.

SFT/smf

Enc.

SECTION 1
Subsurface Investigation
Cape Cod Canal, Massachusetts

Contract No. DACW33-87-D-0007
Delivery order No. 0010

Contracting Officer:

Stanley J. Murphy, Lt. Colonel, CE
Deputy Division Engineer

PREPARED FOR: U. S. Army Corps of Engineers
New England Division
424 Trapelo Road
Waltham, MA 02254-9149

PREPARED BY: Atlantic Testing Laboratories, Limited
P.O. Box 29
Canton, New York 13617

ATL Report No. CD036-1-7-89

July 1989

SECTION 2

TABLE OF CONTENTS

SECTION 3

SCOPE OF INVESTIGATION

a. Delivery Order No. 00010

ORDER FOR SUPPLIES OR SERVICES

Form Approved
OMB No. 0704-0187
Expires Jul 31, 1989

1. CONTRACT/PURCH ORDER NO. DACW3387D0007

2. DELIVERY ORDER NO. 0010

3. DATE OF ORDER. 06/19/89

4. REQUISITION/PURCH REQUEST NO. 96131691660002

5. CERTIFIED FOR NATIONAL DEFENSE UNDER DMS REG 1 DO

6. ISSUED BY CODE 961316
Dept. of the Army
N. E. Division, Corps of Engrs
424 Trapelo Road
Waltham, MA 02254-9149
Carol A. Devany (617)-647-8427

7. ADMINISTERED BY CODE 961316
See Block 6

(CD036)

8. DELIVERY FOB
[X] DEST
[ ] OTHER
(see schedule if other)

9. CONTRACTOR CODE 00001586 FACILITY CODE
NAME AND ADDRESS ATLANTIC TESTING LAB, LIMITED
P. O. BOX 29
CANTON, NY 13617-

10. DELIVER TO FOB POINT BY 07/27/89

11. MARK IF BUS. IS
[X] SMALL
[ ] SMALL DISADVANTAGED
[ ] WOMEN-OWNED

12. DISCOUNT TERMS
0 % 0 Net 0

13. MAIL INVOICES TO
SEE BLOCK 15

14. SHIP TO CODE GEB
Geotechnical Engineering
Branch, Engineering Division,
at issuing office.
DACW3387D0007/0010

15. PAYMENT WILL BE MADE BY CODE FAO
Finance & Accounting Officer
U.S.A. Engr. Div., New England
424 Trapelo Road
Waltham, MA 02254-9149

MARK ALL PACKAGES AND PAPERS WITH CONTRACT OR ORDER NUMBER

16. DELIVERY [X] This delivery order is issued on another Government agency or in accordance with and subject to terms and conditions of above numbered contract.

PURCHASE [ ] Reference your furnish the following on terms specified herein.

ACCEPTANCE. THE CONTRACTOR HEREBY ACCEPTS THE OFFER REPRESENTED BY THE NUMBERED PURCHASE ORDER AS IT MAY PREVIOUSLY HAVE BEEN OR IS NOW MODIFIED, SUBJECT TO ALL OF THE TERMS AND CONDITIONS SET FORTH, AND AGREES TO PERFORM THE SAME.

NAME OF CONTRACTOR | SIGNATURE | TYPED NAME AND TITLE | DATE SIGNED

[ ] If this box is marked, supplier must sign Acceptance and return the following number of copies:

17. ACCOUNTING AND APPROPRIATION DATA/LOCAL USE
96x3123 CA0033440000000 MD $16,644.00

18. ITEM NO.	19. SCHEDULE OF SUPPLIES/SERVICE	20. QUANTITY ORDERED/ACCEPTED* (est)	21. UNIT	22. UNIT PRICE	23. AMOUNT (est)
	FURNISH THE NECESSARY PERSONEL AND EQUIPMENT FOR DRILLING AND SAMPLING IN THE CAPE COD CANAL, MASSACHUSETTS, IN ACCORDANCE WITH ATTACHMENT NO. 1 AND 2				
0001AA	Geologist	40	HR	42.000000	1680.00
0001AC	Per Diem -- Overnight Stay	4	DA	50.000000	200.00
0001AD	Mileage from Waltham, MA & Return	150	MI	0.350000	52.50

*If quantity accepted by the Government is same as quantity ordered, indicate by x. If different, enter actual quantity accepted below quantity ordered and encircle.

24. UNITED STATES OF AMERICA
BY: STANLEY J. MURPHY, LTC CE, DDE CONTRACTING/ORDERING OFFICER

25. TOTAL 16644.00

29. DIFFERENCES

26. QUANTITY IN COLUMN 20 HAS BEEN
[ ] INSPECTED [ ] RECEIVED [ ] ACCEPTED AND CONFORMS TO THE CONTRACT EXCEPT AS NOTED

27. SHIP. NO.
[ ] PARTIAL
[ ] FINAL

28. D.O. VOUCHER NO.

30. INITIALS

32. PAID BY

33. AMT VERIFIED CORRECT FOR

DATE | SIGNATURE OF AUTHORIZED GOVERNMENT REP.

31. PAYMENT
[ ] COMPLETE
[ ] PARTIAL
[ ] FINAL

34. CHECK NUMBER

36. I certify this account is correct and proper for payment

35. BILL OF LADING NO.

DATE | SIGNATURE AND TITLE OF CERTIFYING OFFICER

37. REC'D AT | 38. RECEIVED BY | 39. DATE REC'D | 40. TOTAL CONT. | 41. S/R ACCOUNT NUMBER | 42. S/R VOUCHER NO.

ATLANTIC TESTING LAB, LIMITED

ITEM NO.	SCHEDULE OF SUPPLIES/SERVICES	QUANTITY (est)	UNIT	UNIT PRICE	AMOUNT (est)
0001AD (continued)					
0002AA	Geotechnical Report	1	JB	924.000000	924.00
0004AA	Sample Delivery	1	JB	140.000000	140.00
0006AA	Mobilization and Demobilization	1	JB	1100.000000	1100.00
0006AB	Mileage from/to Waltham, Mass.	150	MI	1.150000	172.50
0006AE	Standby time/on site moves	16	HR	80.000000	1280.00
0010AB	16 ft. boat	3	DA	75.000000	225.00
0010AC	Operator for 12 ft. or 16 ft. boat	3	DA	280.000000	840.00
0010AD	Standby time	8	HR	35.000000	280.00
0010AI	1500 square foot barge	2	DA	2000.000000	4000.00
0010AJ	Standby time for 1500 square foot barge	24	HR	125.000000	3000.00
0014AA	0-50 ft. depth	50	LF	25.000000	1250.00
0018AA	BX, NX size	75	LF	20.000000	1500.00

ATTACHMENT NO. 1

GEB REQUISITION NO. 89-19 DACW33-87-D-0007

EXPLORATION INSTRUCTIONS

PROJECT: Borings and sampling.

SITE: Cape Cod Canal, MA

PURPOSE: Perform four borings to obtain bottom samples to a depth of -35 feet MLW at the East Mooring Basin in the Cape Cod Canal. This information is required to determine the character of sediment.

1. SCOPE OF INVESTIGATIONS

a. General. The East Mooring Basin is located in the Cape Cod Canal as shown on Attachment 2. Each boring will require continuous overburden sampling to a depth of -35 feet MLW. The entire samples will be saved.

b. Inspection.

(1) The services of one geotechnical field inspector are required during performance of the borings.

(2) All samples shall be delivered to the Corps of Engineers Headquarters in Waltham, MA by the field inspector. Sample delivery shall be coordinated with the Director, NED Materials and Water Quality Laboratory at (617)647-8367/8392.

c. Surveys. Boring locations are shown on the detailed plan provided separately. The Contractor shall tape off distances from the dolphins and otherwise position the barge visually from local fixed landmarks. A tideboard shall be placed on a dolphin for the Contractor's use by the Government.

2. SITE CONDITIONS

The Mooring Basin is located in the Cape Cod Canal as shown on Attachment 2. Exact locations of the four borings are shown on a detailed plan provided separately. Each boring will extend to a depth of -35 feet MLW. Water depths range from about -18.6 to -24.8 feet MLW at the boring locations. The tide range is about 8.7 feet. Bottom materials are likely to be silty to gravelly sands. There is access to the drilling site by water. Currents in the Canal can be swift. Sufficient power to maneuver the work barge shall be available whenever moving is necessary.

3. COORDINATION

The Contractor shall notify both Mr. Yuri Yatsevitch (617 647-8387) and Mr. Frank Ciccone (508 759-4413), Corps of Engineers, of the exact start date of drilling at least 5 days in advance. During the work, the inspector shall provide daily telephone reports to Mr. Yatsevitch.

The Contractor shall abide by all regulations governing operations in the Cape Cod Canal. Refer to navigation regulations stated in U.S. Dept. of Commerce publication "United Staes Coast Pilot, Atlantic Coast: Cape Cod to Sandy Hook" (furnished separately). Additional information can be

obtained by contacting the Canal office at 508 759-4413. While working in the Cape Cod Canal, the Contractor shall monitor channel 16 continuously and be capable of switching to channels 12 and 14 for communications with the Cape Cod Canal Office.

4. EXPLORATIONS

The drive sample borings designated FD-1 through 4 on the detailed location plan provided separately. The borings shall be numbered FD-89-1 through 4 in order of their completion on exploration logs and on a plan of explorations.

5. GOVERNMENT REVIEW

The Government will review the draft geotechnical report submittal as well as the completed report. Subsequent to such review, the Contractor shall accomplish any corrections which may be directed as a result of the Government review.

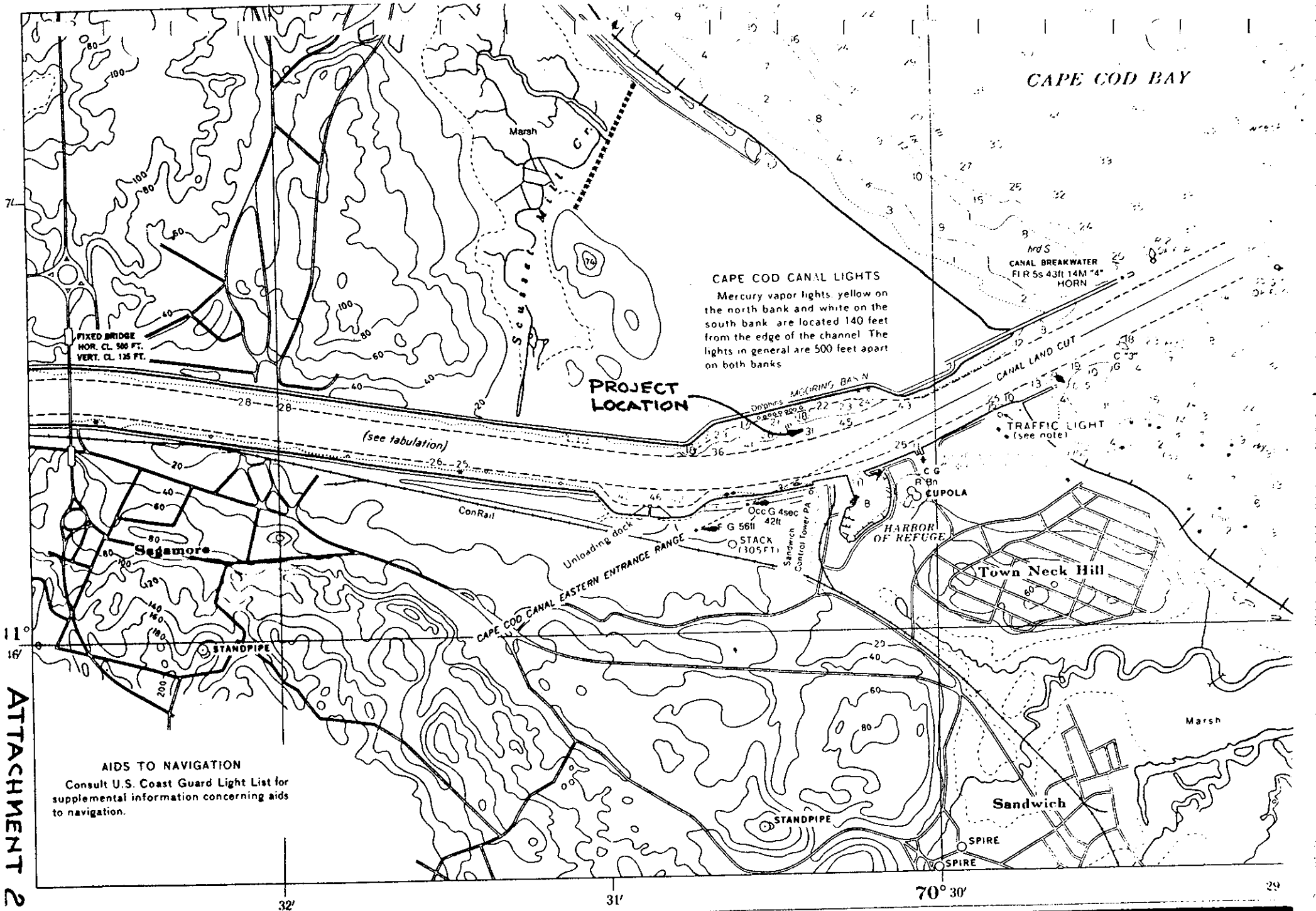
6. COMPLETION SCHEDULE

Services under this contract shall start within fourteen calender days after receipt of the delivery order. Duration of the drilling is expected to be three calender days. The geotechnical report shall be submitted in draft format for review by the Government no later than fourteen calender days after completion of the drilling portion of the field work. The final geotechnical report shall be submitted no later than seven calender days after receipt of the draft report including the action taken on possible comments.

8. QUALITY CONTROL

You will be held responsible for the quality of maps submitted and for all damages caused the Government as a result of your negligence in the performance of any services furnished under the contract.

Although submissions required by your contract are technically reviewed by the Government, it is emphasized that your work must be prosecuted using proper internal controls and review procedures. The letter of transmittal for each submission which you make shall include a certification that the submission has been subjected to your own review and coordination procedures to insure (a) completeness for each discipline commensurate with the level of effort required for that submission, (b) elimination of conflicts, errors, ommisions, and (c) the overall professional and technical accuracy of the submission. Documents which are significantly deficient in any of these areas will be returned to you for correction and/or upgrading prior to our completing our review. Contract submission dates will not be extended if a resubmission of draft material is required for this reason.



ATTACHMENT 2

b. Project Site

The investigation took place in the mooring basin of the Cape Cod Canal in Massachusetts.

A General Plan, Boring Location Plan and two cross sections are included in Section 8. The plans were provided to us in the Delivery Order.

c. Purpose

The purpose of the exploration was to provide information regarding the character of the sediment material at the East Mooring Basin in the Cape Code Canal.

d. Scope of Work

Inspection and exploration instructions, which were provided by the Army Corps of Engineers, New England Division, in Delivery Order No. 0010, are included in Section 3a. General inspection and exploration instructions were provided by the Army Corps of Engineers, New England Division, through the contracted Geotechnical Exploratory Work Various Locations in New England. All correspondence with USACE representatives of inspection and exploration can be found listed in Table I, Daily Activities and Table II, Telephone Log, both included in Section 5.

Drilling and sampling was performed by Atlantic Testing Laboratories' personnel using Atlantic Testing Laboratories' equipment. The test borings were advanced and sampled as indicated on Attachment No. 1 of the Delivery Order (Section 3a) and as outlined in the contract specifications.

SECTION 4

QUALITY CONTROL

a. General Certification Statement

I hereby certify that the records, equipment and procedures mentioned below were used to perform the subsurface exploration described herein. I also certify that the work was performed in a professional manner and meets the requirements set forth in the Delivery Order. This report has been subject to my review and is both complete and technically accurate.

CERTIFIED July 12, 1989

Spencer F. Thew, P.E./L.S.

b. Records Taken

Pertinent drilling procedures, sampling operations, and soil classifications were noted on the following forms provided for use by the Corps of Engineers:

NED-121 Field Log of Test Boring, Summary
NED-58 & 58A Field Log of Test Boring
NED-59 Subsurface Water Observations and Boring Location Sketch

Information outlining overburden characteristics were noted on the Field Log of Test Boring (NED 58 and 58A). A completed series of Field Logs, Surface Water Observations, Boring Location Sketches, and Boring Details are included in Section 8.

Sample jars were labeled using a waterproof black marker and were delivered to the USACE NED Materials and Water Quality Laboratory in Waltham, Massachusetts, on June 29, 1989. The samples were accepted by Richard Berger, USACE on June 29, 1989.

A summary of Daily Activities and Telephone Logs are Tables I and II of Section 5. A chain of custody log is included in Section 6. The Safety Meeting Report (NED 251) is included in Section 7.

c. Equipment Used

A listing of all pertinent equipment and supplies provided by Atlantic Testing Laboratories, Limited.

Drilling equipment:

- CME 45 skid mounted drill rig
- NX (3") casing with drive and spin shoes
- NX drill rod - 2 ft, 5 ft and 10 ft lengths used for sampling
- split spoon samplers, 2" O.D. x 2' in length with 140 lb hammer

Subcontracted equipment:

- 1500 sq ft barge
- crane
- tug boat
- power skiff
- boat slip
- 3 (500 lb) anchors
- 1 barge operator
- 2 tug boat operators (1 operator, 1 helper)
- 1 power skiff operator

d. Procedures

Four (4) borings were performed in the East Mooring Basin in the Cape Cod Canal. This involved locating boring sites, placing a CME 45 drill rig and equipment on a metal barge, towing the barge and equipment to the site, securing the barge, drilling and sampling through the water and into the overburden and demobilizing the barge and equipment.

1. Survey Procedures

Locations were determined by Vicky Murphy, ATL Geotechnical Inspector by the use of a tape and scaled distances from a boring location map provided by the USACE. Borings FD-1 (FD-89-1) through FD-4 (FD-89-4) were referenced using the dolphins and local fixed landmarks. Vertical control was referenced using a tideboard located on a bulkhead on the opposite shore, this elevation was checked by radio with the USACE.

2. Access Procedures

Access to the borings required a metal barge. The CME 45 drill rig was placed onto the barge with a crane at the docks in Woods Hole. A tug boat towed the barge to the site and to each boring location. The barge was secured with heavy ropes and 500 lb anchors.

While in the canal, the barge was accessed with the tug boat or power skiff.

3. Sampling and Drilling Procedures

Sampling techniques as described in the contract and in the delivery order, involved retrieving material using a 2' x 2" O.D. standard split spoon sampler with a 140 lb hammer dropped 30". Bore holes were cased with NX (3") casing with spin shoes in 2 ft, 5 ft and 10 ft lengths. The sampling interval was 2 ft.

Samples were classified in the field in accordance with ASTM D-2488. Soil samples were placed in sample jars. Sample boxes were labeled and delivered to the USACE NED Materials and Water Quality Laboratory on June 29, 1989. A chain of custody log was maintained to document custody of the samples between Atlantic Testing Laboratories and the Corps of Engineers.

The CME 45 skid rig was equipped to effectively advance each hole. The technique used is generally described as follows:

- Standard split spoon sampler with the drill steel was lowered through the water and then driven with 140 lb hammer 2 ft into soils.

- NX (3") casing was lowered over the sample rod to top of soils and then spun with water to the sample depth.

- Sample was extruded and operation was repeated.

Specific drilling procedures for each bore hole have been recorded on the boring logs contained in Section 8d.

SECTION 5

SUMMARY OF DAILY ACTIVITIES
AND
TELEPHONE LOG

TABLE I
DAILY ACTIVITIES LOG

CD036 - CAPE COD CANAL

June 23, 1989 Friday
- ATL drillers mobilized the CME 45 skid rig to Clark Contractors yard in Woods Hole, MA.

June 26, 1989 Monday
- Vicky Murphy, ATL Geotechnical Inspector, Randy Todd and Kevin Hawkins, ATL drillers met at 6 a.m. at ATL's Canton office to be briefed by Spencer Thew, President ATL, on the Cape Cod Canal project.
- At 6:30 a.m., Vicky Murphy, Randy Todd and Kevin Hawkins flew out of Potsdam Airport.
- 9:30 a.m. landed in Hyannis Airport, drove to Woods Hole, MA.
- At 10 a.m. met with Dan Clark, Clark Contractors, and discussed the specifics of the project. Clark's 2-man crew and ATL's drill crew started loading the barge.
- At 10:30 a.m. V. Murphy called the ACOE in Bourne, MA and informed Mr. Frank Morris, Assistant Engineer, of the time the barge would be arriving at the mooring basin. At this time, it was thought that the barge would arrive at the site at approximately 6:30 p.m. on June 26. Mr. Morris gave V. Murphy directions to the ACOE office by land and said he would relate the details of the job to V. Murphy when she arrived.
- At 11 a.m., V. Murphy and R. Todd called Spencer Thew, ATL, to discuss exra equipment required for safe anchorage. Mr. Thew told V. Murphy to do whatever was necessary to make the job safe.
- 10 a.m. to 5 p.m. loaded the drill rig and equipment onto the barge with crane, mobilized tug boat to Woods Hole, MA, secured tug boat and barge.
- At 1:30 p.m., ATL personnel went to the ACOE office in Bourne, MA and met with Frank Morris, Assistant Engineer for the ACOE. Mr. Morris related to ATL personnel the details of the job.
- Peter, ACOE, drove ATL personnel to the shoreline of the job site and to the marina where the barge would have to be docked at night.
- Randy Todd and Kevin Hawkins, ATL drill crew, received permission from the ACOE to park the drill trailer in the parking lot at the ACOE office in Bourne, MA.
- At 5 p.m. V. Murphy called Dan Clark to get the arrival time of the barge at the site. Mr. Clark informed V. Murphy that due to unfavorable tides and winds, the barge had not yet departed and would not be able to leave Woods Hole until approximately 6 a.m. on June 27. Dan estimated that the barge would be on site at 11:30 a.m. on June 27.
- 5:30 p.m. terminated for the day.

- 7-1/2 hours stand by time for drill crew (10 a.m. - 5:30 p.m.).

June 27, 1989
Tuesday

7 a.m. Vicky Murphy, ATL Geotechnical Inspector, Randy Todd and Kevin Hawkins, ATL drill crew on site.

- 7 a.m. to 11:30 a.m., stand by time. Barge and drill rig being mobilized to the site (4-1/2 hrs).
- At 8:15 a.m., Dan Clark called V. Murphy and confirmed the barge's arrival time to be 11:30 a.m.
- At 9:15 a.m., V. Murphy called Frank Ciccone, ACOE, Bourne, MA and informed him that the barge would be arriving on the site at approximately 11:30 a.m.
- At 9:30 a.m., V. Murphy called Mr. Yuri Yatsevitch and told him of the progress of the project. Mr. Yatsevitch told V. Murphy that he would try and make a site visit/inspection on June 28.
- At 10:15 a.m., ATL personnel went to the ACOE office in Bourne, MA to see if they could get a key to the gates for the access roads. Mr. Frank Morris, ACOE, told ATL personnel they would not be able to access the barge from the shore by the dolphins. The tug boat would have to pick them up at the marina opposite the dolphins.
- At 10:45 a.m., V. Murphy called Dan Clark to get the location where ATL personnel would be picked up. Chip of Clark Contractors told V. Murphy that Dan Clark and Steve, both of Clark Contractors, were on their way to the marina and would coordinate the pick up.
- At 11 a.m. Mr. Clark and Steve arrived at the marina and informed ATL personnel that the barge should be in sight soon. The tug boat was going to first secure the barge to the western dolphin and then come into the marina to get ATL personnel and Steve of Clark Contractors. Tim, Clark Contractors, was already on the barge.
- At 11:30 a.m., tugboat with one operator and one helper picked up ATL personnel and Steve, Clark Contractors.
- 11:30 a.m. to 1:30 p.m., positioning barge on FD-1, setting anchors, securing barge, assembling casing and cased through water.
- 1:30 - 2:30 p.m., performed sampling.
- 2:30 - 4 p.m., pulling casing and positioning barge on FD-2, setting anchors, securing barge, cased through water.
- 4 - 4:45 p.m., sampling.
- 4:45 - 6 p.m., pulling and disassembling casing; tug boat pulled the barge into the marina for the night; secured the barge as tides were changing.
- Power skiff and operator monitored and controlled water traffic during sampling program.
- 6 p.m. work terminated for the day.
- 6 - 6:30 p.m. safety meeting.

- 9-1/4 hours stand by/on-site moves.
  7 a.m. - 1:30 p.m. = 6-1/2
  2:30 - 4 p.m. = 1-1/2
  4:45 - 6 p.m. = 1-1/4

June 28, 1989
Wednesday

- 6:30 a.m., Vicky Murphy, ATL Geotechnical Inspector, Randy Todd and Kevin Hawkins, ATL drill crew, Clark Contractors' personnel and tug boat crew boarded the barge and tug boat.
- 6:30 - 8:30 a.m., positioning the barge on FD-3, setting anchors, securing barge, assembling casing and cased through water.
- 8:30 - 9:15 a.m., sampling.
- 9:15 - 10:15 a.m., pulling casing, positioning barge on FD-4, setting anchors, securing barge, cased through water.
- 10:15 - 11:30 a.m., sampling.
- 11:30 - 11:45 a.m., pulling casing, disassembling casing.
- At 11:30 a.m., Mr. Yuri Yatsevitch, ACOE, made a site visit and was on the shore by the dolphins.
- 11:45 a.m. - 1:30 p.m., pulled casing, pulled up anchors, tug boat pulled the barge into the marina.
- 1:30 - 3:30 p.m., secured and unloaded the barge, removed equipment and samples. Discussed when the barge would be towed back so that drill rig could be removed.
- At 1:30 p.m. V. Murphy called Frank Ciccone and informed him that the project was complete but the barge, with drill rig on it would have to remain at the marina until tides and winds were favorable in the canal - possibly June 29 in the afternoon or the morning of June 30.
- At 1:30 p.m., Mr. Yuri Yatsevitch arrived at the marina and spoke with V. Murphy. Mr. Yatsevitch wanted to know findings.
- Power skiff and operator monitored and controlled water traffic during sampling program.
- 3:30 p.m. work terminated for the day.

- 6-3/4 hours stand by time/on site moves.
  6:30 - 8:30 a.m. = 2
  9:15 - 10:15 a.m. = 1
  11:45 - 3:30 = 3-3/4

June 29, 1989
Thursday

- 6 a.m. - 3 p.m., ATL drill crew, tug boat crew, and barge operator demobilized barge and drill rig from marina to Woods Hole, MA; unloaded drill rig and equipment.
- 6 a.m. - 7 a.m., V. Murphy organized samples and logs for delivery to USACE.

- 9 hours stand by time for drill crew.
  6 a.m. - 3 p.m. = 9

TABLE II
TELEPHONE ACTIVITY LOG

CD036 - CAPE COD CANAL

June 15, 1989 Thursday	Patrick Sullivan, ATL to Yuri Yatsevitch, USACE at 9:15 a.m.
	P. Sullivan informed Y. Yatsevitch that ATL was prepared to start work on Monday, June 26, 1989.
	Y. Yatsevitch told P. Sullivan that he would start the paper work, FAX ATL a copy and put the original in the mail.
June 22, 1989 Thursday	Patrick Sullivan, ATL to Yuri Yatsevitch, USACE at 10:15 a.m.
	P. Sullivan confirmed to Y. Yatsevitch that ATL would start work on Monday, June 26.
	Patrick Sullivan, ATL to Frank Ciccone, USACE at 11:45 a.m.
	P. Sullivan left a message with the secretary regarding ATL beginning work on Monday morning at the East Mooring Basin.
June 26, 1989 Monday	Vicky Murphy, ATL to Frank Morris, USACE, 10:30 a.m.
	V. Murphy informed F. Morris of the barge's arrival time on the site.
	F. Morris gave V. Murphy directions, by land, to the USACE office in Bourne, MA and said he would relate the job details to V. Murphy when she arrived.
	Vicky Murphy, ATL to Spencer Thew, ATL, 11 a.m.
	V. Murphy discussed the extra equipment required for safe anchorage.
	S. Thew told V. Murphy to do whatever necessary to make the job safe.
	Vicky Murphy, ATL to Daniel Clark, Clark Contractors, 5 p.m.
	V. Murphy called to find out the time the barge would arrive on site.
	D. Clark informed V. Murphy that due to unfavorable tides and winds, the barge had not yet departed and would not be able to leave Woods Hole until 6 a.m. on June 27. D. Clark estimated that the barge would be on site at 11:30 a.m. on June 27.

June 27, 1989
Tuesday

Daniel Clark, Clark Contractors to Vicky Murphy, ATL 8:15 a.m.

D. Clark confirmed to V. Murphy that the barge would be arriving on the site at approximately 11:30 a.m.

Vicky Murphy, ATL to Frank Ciccone, USACE, 9:15 a.m.

V. Murphy informed F. Ciccone that the barge would be arriving on the site at approximately 11:30 a.m.

Vicky Murphy, ATL to Yuri Yatsevitch, USACE, 9:30 a.m.

V. Murphy informed Y. Yatsevitch of the progress of the project.

Y. Yatsevitch told V. Murphy that he would try and make a site visit/inspection on June 28.

Vicky Murphy, ATL to Chip, Clark Contractors, 10:45 a.m.

V. Murphy asked Chip the location where ATL personnel would be picked up to access the barge. Chip informed V. Murphy that ATL personnel would be met by D. Clark and Steve of Clark Contractors at the marina and D. Clark would coordinate the pick up.

June 28, 1989
Wednesday

Vicky Murphy, ATL to Frank Ciccone, USACE, 1:30 p.m.

V. Murphy informed F. Ciccone that the project was complete but the barge, with drill rig on it, would have to remain at the marina until tides and winds were favorable in the canal (possible June 29 in the afternoon or June 30 in the morning).

June 29, 1989
Thursday

Randy Todd, ATL to Richard Berger, USACE, 10:30 a.m.

R. Todd called to inform the USACE NED Materials and Water Quality Laboratory in Waltham, MA that he would be delivering the soil samples.

R. Berger gave R. Todd directions to the laboratory.

Yuri Yatsevitch, USACE to Vicky Murphy, ATL, 11:45 a.m.

Y. Yatsevitch left a message with ATL secretary saying he needed a copy of the logs faxed to him on this date with designations and elevations.

June 29, 1989 Continued -

Vicky Murphy, ATL to Yuri Yatsevitch, USACE, 3 p.m.

V. Murphy asked Y. Yatsevitch if he could wait for the logs until the following day, and if these would be unofficial.

Y. Yatsevitch told V. Murphy that he could wait until June 30 for the logs and that they would be unofficial.

SECTION 6

CHAIN OF CUSTODY LOG

#(317)-17 ~367, ~397

ATLANTIC TESTING LABORATORIES, Limited

CHAIN OF CUSTODY LOG
FOR
SOIL SAMPLES & ROCK CORES

Boring Logs: _____

Jar Samples: 2 Boxes (23 samples) FD1, FD2, FD3, FD4

Rock Cores: _____

Tubes: _____

DATE & TIME OF TRANSFER	FROM	TO	LOCATION	SIGNATURE OF RECEIVER
6/29/89	Cape Cod		Waltham	Richard L. Berge

SECTION 7

SAFETY REPORTS

WEEKLY SAFETY MEETING

NEDSO

Date held 6/27/89

THRU: Area Engineer, _____ Area

Time 6:00 P.M.

TO: Safety Office, NED

1. Weekly safety meeting was held this date for the following personnel:

Contract No. DACW33 -87-D-0007 Contractor _____

Conducted By Vicky L. Murphy Personnel present (Contr) ATL (3)

(Sub) DAN CLARK CONTRACTORS (4)

(Govt) _____

Subjects discussed (Note, delete, or add):

Individual Protective Equipment - ✓

Prevention of Falls - ✓

Safe Lifting Techniques - ✓

Emergency Communications - ✓

Fire Prevention - ✓

Sanitation, First Aid - ✓

Tripping Hazards - trash, hose, nails in lumber - ✓

Staging, Ladders, Concrete Forms -

Hand Tools, Portable Power Tools, Woodworking Machinery -

Equipment Maintenance (Zero defects) - ✓

Hoisting Equipment - ✓

Ropes, Hooks, Chains and Slings - ✓

Electrical Grounding, Temporary Wiring -

Lockouts for safe clearance procedures - electrical, pressure, moving parts

Welding -

Excavations -

Loose Rock and Steep Slopes -

Explosives - ✓

Water Safety - ✓

Other -

Prepared by Vicky L. Murphy Title I.E.

2. Forwarded.

Signature _____

Resident Engineer

CF:

SECTION 8

FIELD INSPECTOR'S LOGS

CORPS OF ENGINEERS, U. S. ARMY
NEW ENGLAND DIVISION
FOUNDATION AND MATERIALS BRANCH

FIELD LOG OF TEST BORING

PROJECT NO. CO 036

Site Cape Cod Canal — Page 1 of 4 Pages

Hole No. FD-89-1 Diam. (Casing) 3in. (NX) — Boring Started 6/27/89 1:00 pm

Co-ordinates: See Boring Location Plan — Boring Completed 6/27/89 2:45 pm

Drilled by Atlantic Testing Laboratories, Limited
Randy Todd and Kevin Hawkins — Report Submitted

Purpose of Exploration To determine the character of sediment

Elevation Top of Hole -24 ft. below M.L.W
Total Overburden Drilled 12 Feet
Elevation Top of Water +0.5 ft. above M.L.W.
Elevation Bottom of Hole -36 ft. below M.L.W.
Total Rock Drilled 0.0 Feet
Total Depth of Hole 36.5 Feet
Core Recovered — %
Core Recovered — Ft.; — Diam. — In.
Soil Samples 1 3/8 In. Diam. 6 No.
Soil Samples — In. Diam. — No.

Casing Left In Place 0.0 Feet
Total length of casing: 40.5 Feet
6' of casing through barge
(see boring detail page 4)

Water Table Depth +0.5 ft. above M.L.W.
24.5 ft. of water above top of soils

Depth From	Depth To	Method of Drilling and Type of Bit Used
0.0	10.0'	NX Casing, using water (3")
0.0'	12.0'	1 3/8" I.D. Standard Split Spoon Sampler
		with 140 lbs. Hammer

INDEX

Prepared by Vicky L. Murphy
Field Data — Lab. Data

Submitted by Atlantic Testing Laboratories, Ltd.

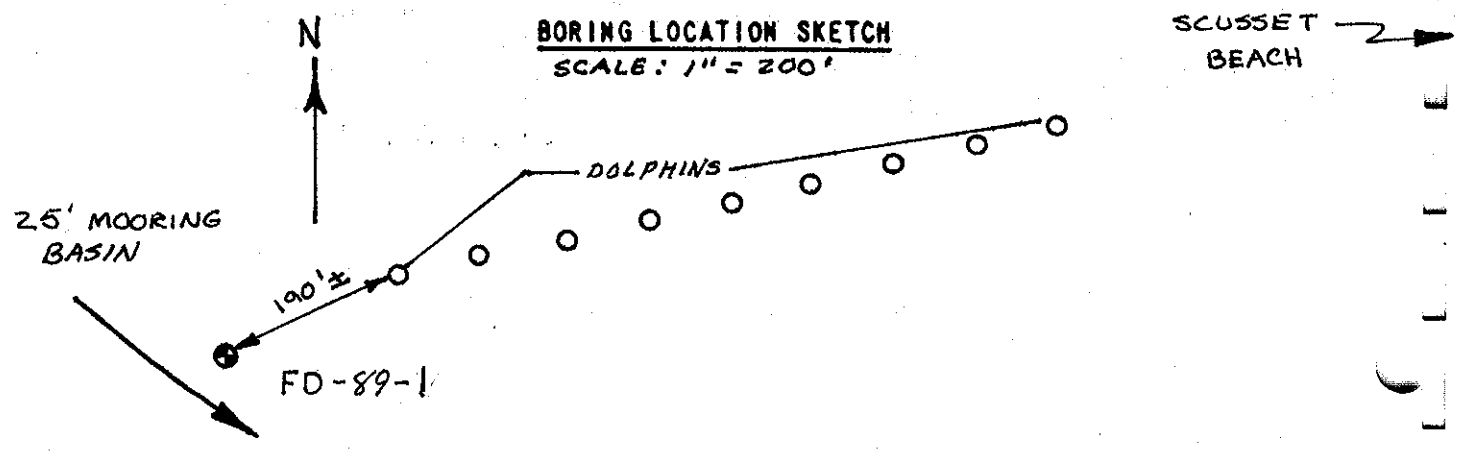
NED FORM DEC 63 121

REPLACES EDITION OF JUN 51 WHICH MAY BE USED UNTIL EXHAUSTED

GROUND WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF HOLE	DEPTH TO WATER	ELEVATION WATER	REMARKS
6/27	1:00 pm	-34 ft. below MLW	-36 ft. below MLW	0.0 ft.	+0.5 ft. above MLW	The tide was rising as drilling progressed
AVERAGE GROUND WATER ELEVATION _____						

Note: Depths are in feet below



U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site CAP COD CANAL — Page 2 of 4 Pages

Boring No. FD-89-1 Desig. ____ Diam. (Casing) 3"

Co-ordinates: SEE BORING LOCATION PLAN

Elevation Top of Boring −24 ft. below M.L.W.
Total Overburden Drilled 12 Feet
Elevation Top of Water +0.5 ft above M.L.W.
Total Rock Drilled 0.0 Feet
Elevation Bottom of Boring −36 ft. below M.L.W.
Total Depth of Boring 36.5 Feet
Core Recovered ____ % No. Boxes ____
Core Recovered ____ Ft : ____ Diam. ____ In.
Soil Samples 1 3/8 In. Diam. 6 No.
Soil Samples ____ In. Diam. ____ No.

Hammer Wt. 140 lbs. Boring Started 6/27
Hammer Drop 30 in. Boring Completed 6/27
Casing Left 0.0
Surface Water Data: Back of Page 1
Obs. Well ____
Drilled By Randy Todd and Kevin Hawkins
Mfg. Des. Drill CME 45
Inspected By: Vicky L. Murphy
Classification By: Vicky L. Murphy
Classification By: ____

DEPTH 1"=	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1	1 3/8"	2'	W.O.H. W.O.H. W.O.H. 1	Sampled with 1 3/8" I.D. spoon with 140 lbs. hammer to −26 ft. below M.L.W.	Greyish-Brown f SAND; trace SILT (s,np) Recovery = 4" = 17%
	2	1 3/8"	4'	5 1 W.O.H. 4	Spun 3" casing 6ft. through barge, 24.5 ft. through water and 2 ft. through soils to 26.5 ft. below existing water level (−26' below MLW) Sampled with 1 3/8" I.D. spoon to −28 ft. below M.L.W.	Grey mf SAND; little f GRAVEL; trace SILT (s,np) Recovery = 1" = 4%
	3	1 3/8"	6'	2 3 4 5	Spun 3" casing 2 ft. through soils to 28.5 ft. below existing water level (−28' below M.L.W.) Sampled with 1 3/8" I.D. spoon to −30 ft. below M.L.W.	Grey cmf SAND; trace SILT (s,np) Recovery = 12" = 50%
	4	1 3/8"	8'	11 10 10 12	Spun 3" casing 2 ft. through soils to 30.5 ft. below existing water level (−30' below MLW) Sampled with 1 3/8" I.D. spoon to −32 ft below MLW	Grey f SAND; trace SILT (s,np) Recovery = 10" = 42%
	5	1 3/8"	10'	3 4 7 17	Spun 3" casing 2 ft. through soils to 32.5 ft. below existing water level (−32' below MLW) Sampled with 1 3/8" I.D. spoon to −34 ft. below MLW	Grey f SAND; little SILT (s,np) Recovery = 24" = 100%

GENERAL REMARKS: W.O.H. – Weight of Hammer
M.L.W. – Mean Low Water
24.5 ft. of water above top of hole at start (1:00 pm)
Water Level = +0.5 ft above M.L.W. at 1:00 pm

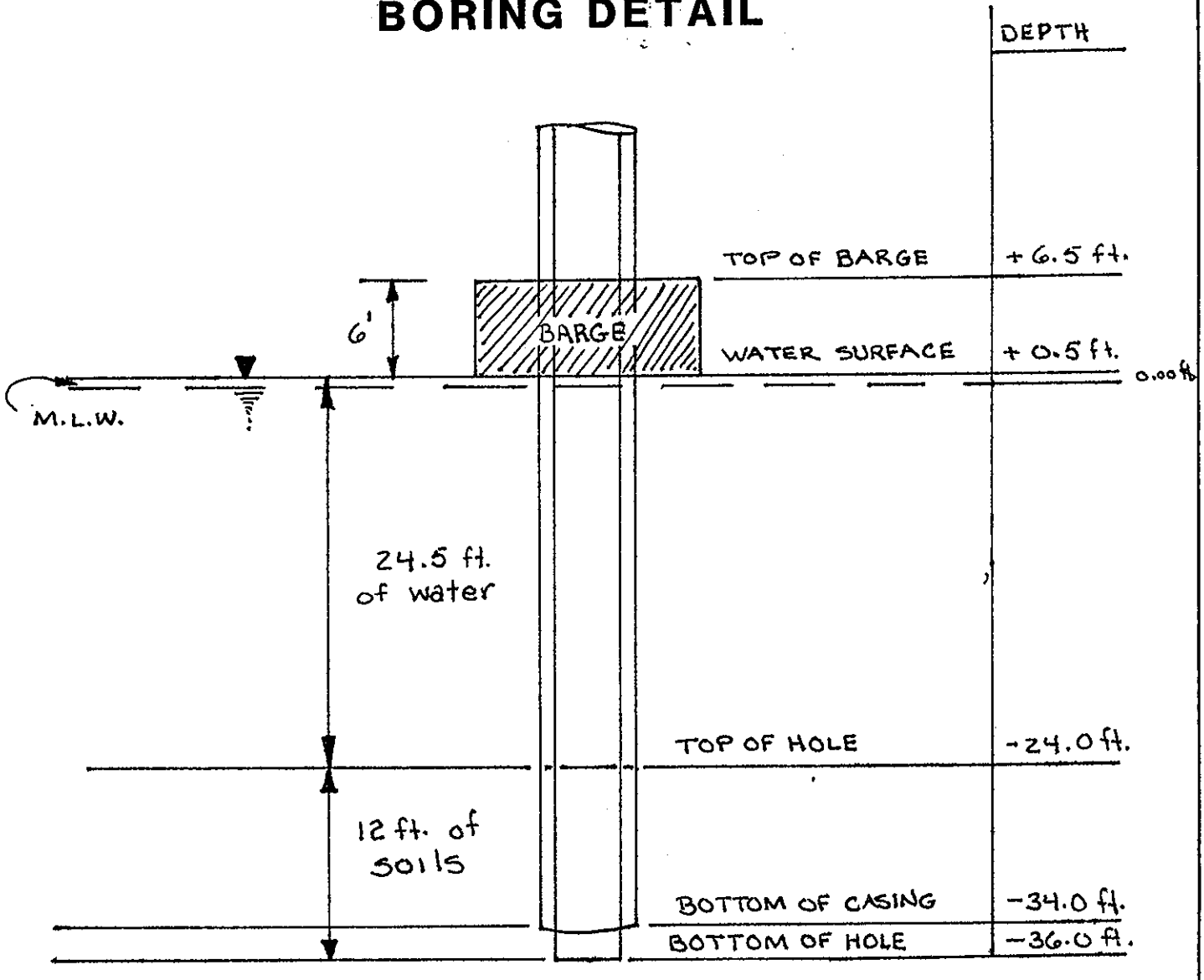
Site CAPE COD CANAL | Boring No. FD-89-1 | Page 3 of 4

DEPTH	CORE/SAMPLE NO.	CORE/SAMPLE SIZE	CORE/SAMPLE DEPTH RANGE	BLOWS PER FT / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	6	1 3/8"	12'	6 3 4 5	SPUN 3" casing 2ft. through soils to 34.5 ft. below existing water level (-34' below MLW) Sampled with 1 3/8" I.D. spoon to -36 ft below M.L.W.	Grey f SAND; little SILT (s,np) Recovery = 10" = 42%

atl ATLANTIC TESTING LABORATORIES, Limited

SUBJECT	JOB NO.	BY	DATE	SHEET
FD-89-1	CD 036	VLM	7/7/89	4 of 4

BORING DETAIL



*All depths referenced to M.L.W. = Mean Low Water = 0.00 ft.

CORPS OF ENGINEERS, U. S. ARMY
NEW ENGLAND DIVISION
FOUNDATION AND MATERIALS BRANCH

FIELD LOG OF TEST BORING

PROJECT NO. CD 036

Site Cape Cod Canal — Page 1 of 3 Pages

Hole No. FD-89-Z Diam. (Casing) 3 in. (NX) — Boring Started 6/27/89 3:45 pm

Co-ordinates: See Boring Location Plan — Boring Completed 6/27/89 5:00 pm

Drilled by Atlantic Testing Laboratories, Limited
Randy Todd and Kevin Hawkins — Report Submitted

Purpose of Exploration To determine the character of sediment

Elevation Top of Hole −26.4 ft. below M.L.W.
Total Overburden Drilled 8 Feet
Elevation Top of Water +4.6 ft. above M.L.W.
Elevation Bottom of Hole −34.4 ft. below M.L.W.
Total Rock Drilled 0.0 Feet
Total Depth of Hole 39.0 Feet
Core Recovered — %
Core Recovered — Ft.; — Diam. — in.
Soil Samples 1 3/8 in. Diam. 4 No.
Soil Samples — in. Diam. — No.

Casing Left in Place 0.0 Feet
Total Length of Casing 43 Feet
6 ft. of casing through barge
(see boring detail page 3)

Water Table Depth +4.6 ft. above M.L.W.
31 ft. of water above top of soils

Depth From	Depth To	Method of Drilling and Type of Bit Used
0.0'	6.0'	NX Casing, using water (3")
0.0'	8.0'	1 3/8" I.D. Standard Split Spoon Sampler
"	"	with 140 lbs. Hammer

INDEX

Prepared by Vicky L. Murphy
Field Data — Lab. Data

Submitted by Atlantic Testing Laboratories, Limited

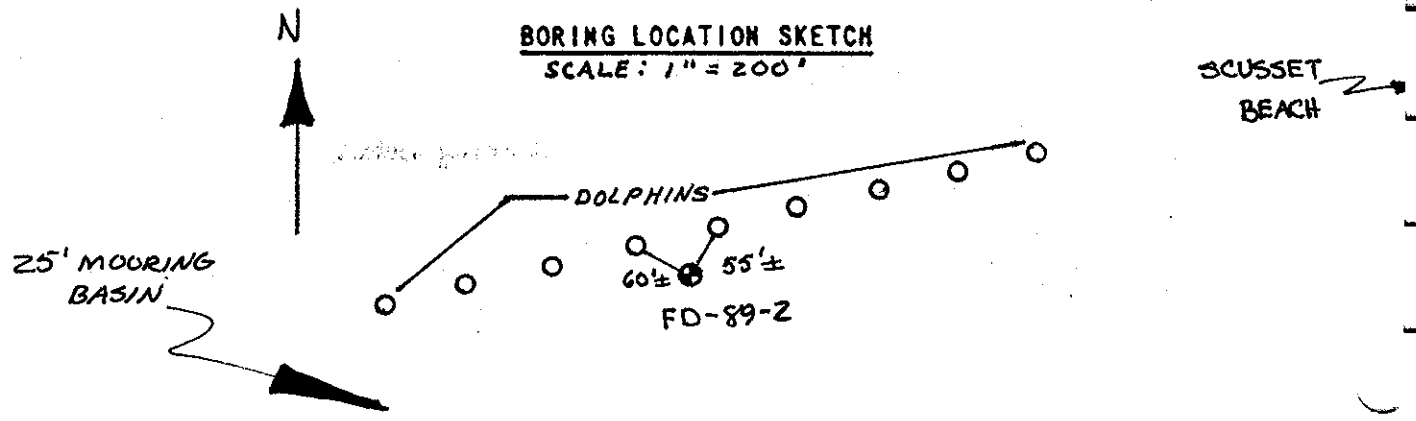
NED FORM DEC 63 121

REPLACES EDITION OF JUN 51 WHICH MAY BE USED UNTIL EXHAUSTED

GROUND WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF HOLE	DEPTH TO WATER	ELEVATION WATER	REMARKS
6/27	3:45 pm	-32-4 ft. below M.L.W.	-34-4 ft. below M.L.W.	0.0'	+4.6 ft. above M.L.W.	The tide was rising as drilling progressed
					AVERAGE GROUND WATER ELEVATION	

Note: Depths are in feet below mean low water (MLW)



U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site CAPE COD CANAL, MA Page 1 of 3 Pages

Boring No. FD-89-2 Desig. _____ Diam. (Casing) 3 in.

Co-ordinates: SEE BORING LOCATION PLAN

Elevation Top of Boring -26.4 ft. below M.
Total Overburden Drilled 8 Feet
Elevation Top of +4.6 ft. above M.
Total Rock Drilled 0.0 Feet
Elevation Bottom of Boring -34.4 ft. below M.
Total Depth of Boring 39.0 Feet
Core Recovered ___ % No. Boxes ___
Core Recovered ___ Ft : ___ Diam. ___ In.
Soil Samples 1 3/8 In. Diam. 4 No.
Soil Samples ___ In. Diam. ___ No.

Hammer Wt. 140 lbs. Boring Started 6/27
Hammer Drop 30 in. Boring Completed 6/27
Casing Left 0.0 ft.
Surface Water Data: Back of Page 1
Obs. Well ___
Drilled By Randy Todd and Kevin Hawkins
Mfg. Des. Drill CME 45
Inspected By: Vicky L. Murphy
Classification By: Vicky L. Murphy
Classification By: ___

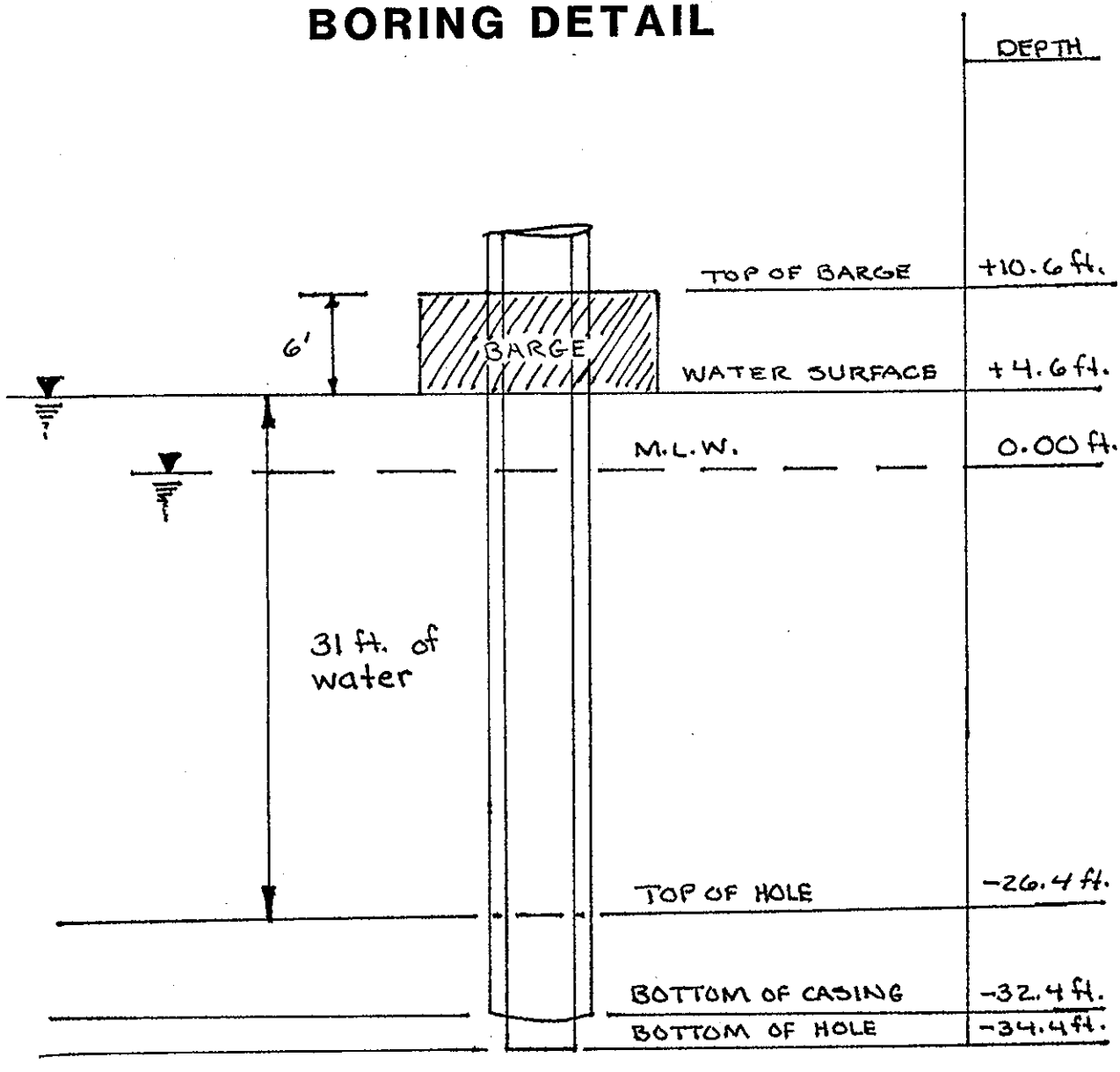
DEPTH	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1	1 3/8"	2'	3 3 5 6	Sampled with 1 3/8" I.D. spoon with 140 lbs. hammer to -28.4 ft below MLW	Grey mf+ SAND; trace SILT (s,np) - Sample contained traces of o.l Recovery = 18" = 75%
	2	1 3/8"	4'	4 3 2 3	Spun 3" casing 6ft. through barge, 31 ft. through water and 2ft. through soils to 33 ft. below existing water level (-28.4' below MLW) Sampled with 1 3/8" I.D. spoon to -30.4 ft below MLW	Grey f SAND; little SILT (s,np) Recovery = 10" = 42%
	3	1 3/8"	6'	3 2 3 4	Spun 3" casing 2ft. through soils to 35 ft. below existing water level (-30.4' below MLW) Sampled with 1 3/8" I.D. spoon to -32.4 ft. below MLW	Grey f SAND; little SILT (s,np) Recovery = 24" = 100%
	4	1 3/8"	8'	14 10 9 7	Spun 3" casing 2ft. through soils to 37 ft. below existing water level (-32.4' below MLW) Sampled with 1 3/8" I.D. spoon to -34.4 ft. below MLW	Grey f SAND; little SILT (s,np)

GENERAL REMARKS: M.L.W. - Mean Low Water
31 ft. of water above top of hole at start (3:45 pm)
Water Level = +4.6 ft. above M.L.W. at 3:45 pm

atl ATLANTIC TESTING LABORATORIES, Limited

SUBJECT	JOB NO.	BY	DATE	SHEET
FD-89-2	CD 036	VLM	7/6/89	3 of 3

BORING DETAIL



* All depths referenced to M.L.W. = Mean Low Water = 0.00 ft.

CORPS OF ENGINEERS, U. S. ARMY
NEW ENGLAND DIVISION
FOUNDATION AND MATERIALS BRANCH

FIELD LOG OF TEST BORING

PROJECT NO. CO-036

Site Cape Cod Canal — **Page 1 of 3 Pages**

Hole No. FD-89-3 **Diam. (Casing)** (NX) 3 in. — **Boring Started** 6/28/89 8:15 am

Co-ordinates: SEE BORING LOCATION PLAN — **Boring Completed** 6/28/89 9:30 am

Drilled by Atlantic Testing Laboratories, Limited — **Report Submitted** _____
Randy Todd and Kevin Hawkins

Purpose of Exploration To determine the character of sediment

Elevation Top of Hole +25.2' below M.L.W.
Total Overburden Drilled 10 Feet
Elevation Top of Water +7.8' above M.L.W.
Elevation Bottom of Hole -35.2 below M.L.W.
Total Rock Drilled 0.0 Feet
Total Depth of Hole 43.0 Feet
Core Recovered — %
Core Recovered — Ft.; — Diam. — In.
Soil Samples 1 3/8 In. Diam. 5 No.
Soil Samples _____ In. Diam. _____ No.

Casing Left in Place 0.0 Feet
Total length of Casing 47.0 Feet
6 ft. of casing through barge
(see boring detail)

Water Table Depth +7.8' above M.L.W.
33 ft. above top of soils

Depth From	Depth To	Method of Drilling and Type of Bit Used
0.0	8.0	NX CASING using water (3")
0.0	10.0	1 3/8" I.D. Standard Split Spoon sampler
		with 140 lb. hammer.

INDEX

Prepared by Vicky L. Murphy
Field Data — Lab. Data

Submitted by Atlantic Testing Laboratories, Limited

NED FORM DEC 63 121

REPLACES EDITION OF JUN 51 WHICH MAY BE USED UNTIL EXHAUSTED

GROUND WATER OBSERVATIONS

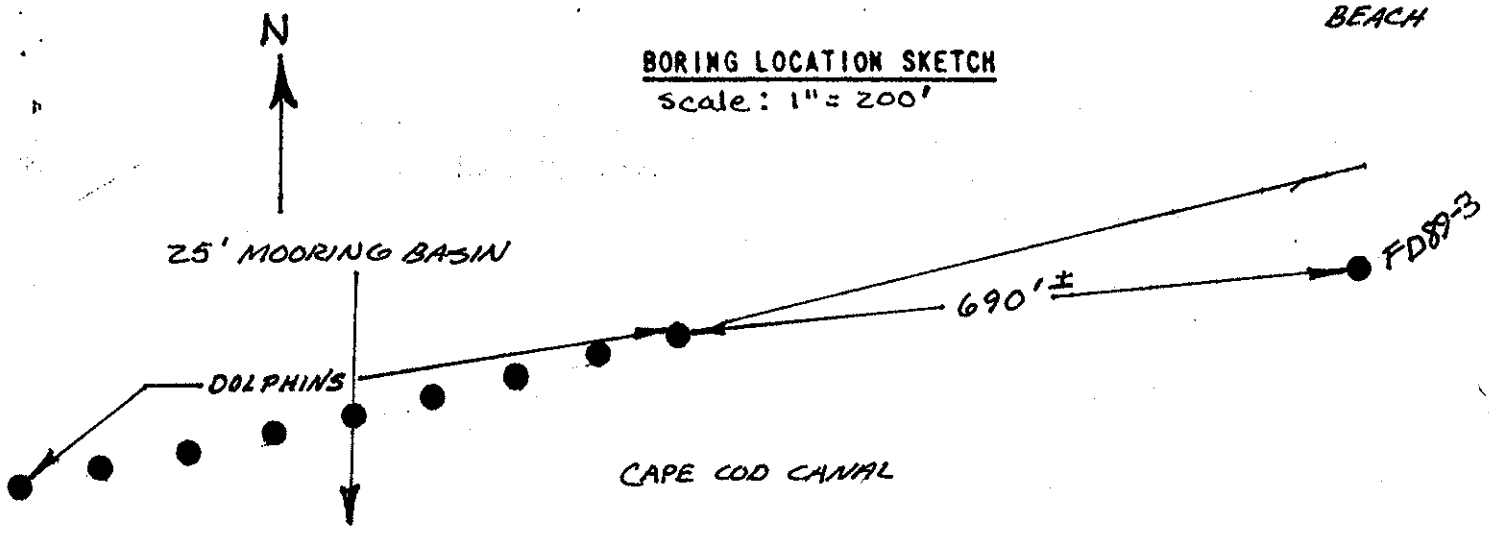
DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF HOLE	DEPTH TO WATER	ELEVATION WATER	REMARKS
6/28	8:15	-33.2 ft. below M.L.W.	-35.2' ft. below M.L.W.	0.0 ft.	+7.8 ft. above M.L.W.	THE TIDE WAS FALLING AS DRILLING PROGRESSED
AVERAGE GROUND WATER ELEVATION _____						

Note: Depths are in feet below M.L.W.

SCUSSET BEACH

BORING LOCATION SKETCH

scale: 1" = 200'



SANDWICH, MA

U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site CAPE COD CANAL Page 2 of 3 Pages

Boring No. FD-89-3 Desig. ____ Diam. (Casing) 3"

Co-ordinates: SEE BORING LOCATION PLAN

Elevation Top of Boring -25.2' below M.L.W.
Total Overburden Drilled 10 Feet
Elevation Top of Water +7.8' above M.L.W.
Total Rock Drilled 0.0 Feet
Elevation Bottom of Boring -35.2' below M.L.W.
Total Depth of Boring 43.0 Feet
Core Recovered — % No. Boxes —
Core Recovered — Ft : — Diam. — In.
Soil Samples 1 3/8 In. Diam. 5 No.
Soil Samples ____ In. Diam. ____ No.

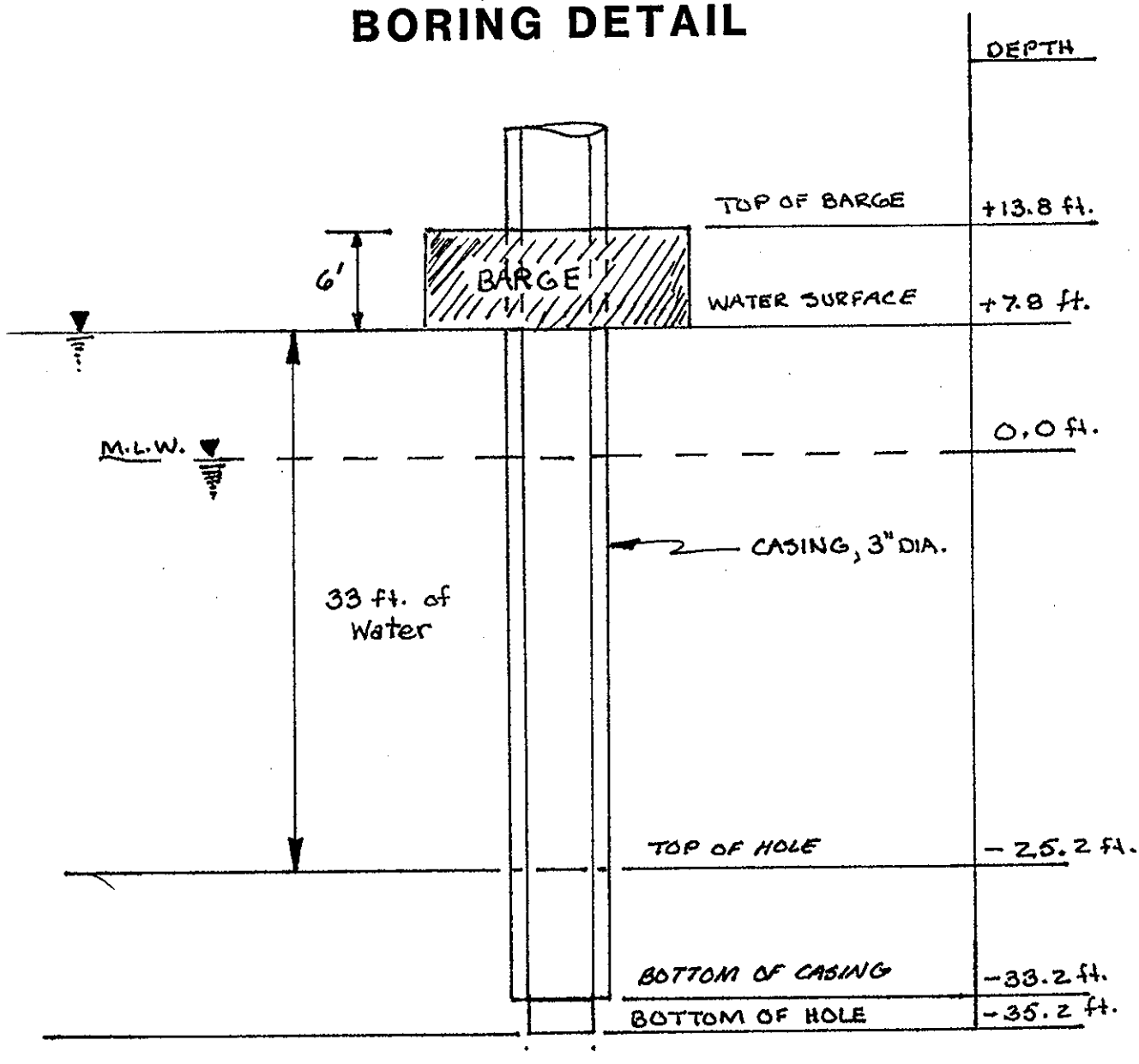
Hammer Wt. 140 lbs. Boring Started 6/28/89
Hammer Drop 30 in. Boring Completed 6/28/89
Casing Left 0.0 ft.
Surface Water Data: Back of Page 1
Obs. Well —
Drilled By Randy Todd and Kevin Hawkins
Mfg. Des. Drill CME 45
Inspected By: Vicky L. Murphy
Classification By: Vicky L. Murphy
Classification By: ____

DEPTH In Ft.	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1	1 3/8"	2'	W.O.H. W.O.H. 3 5	Sampled with 1 3/8" I.D. spoon with 140 lbs. Hammer	Grey mf + SAND; trace SILT (s,np) - Sample contained traces of oil Recovery = 18" = 75%
	2	1 3/8"	4'	3 2 7 6	SPUN 3" CASING 6 ft through barge, 33 ft. through water and 2 ft. through soils. (-27.2' below MLW) Sampled with 1 3/8" I.D. spoon with 140 lbs. Hammer	Dark Grey mf+ SAND; trace SILT (s,np) - Sample contained traces of oil. Recovery = 8" = 33%
	3	1 3/8"	6'	4 4 3 4	Spun Casing 2 ft. through soils to 37 ft. below existing water level (-29.2' below MLW) Sampled with 1 3/8" I.D. spoon with 140 lbs. Hammer	Grey SILT and f SAND; trace CLAY (s,vsp) Recovery = 10" = 42%
	4	1 3/8"	8'	3 3 4 9	SPUN 3" CASING 2 ft. through soils to 39 ft. below existing water level (-31.2' MLW) Sampled with 1 3/8" I.D. spoon with 140 lbs. hammer	Grey SILT; some CLAY; little f SAND (s,p) Recovery = 20" = 83%
	5	1 3/8"	10'		SPUN 3" CASING 2 ft. into soils. to 41 ft. below existing water level (-33.2 below MLW) Sampled with 1 3/8" I.D. spoon with 140 lbs. hammer	Grey f SAND and SILT (s,np) Recovery = 18" = 75%

GENERAL REMARKS: W.O.H. — Weight of Hammer
M.L.W. — Mean Low Water
- 33 ft. of water above top of hole at start (8:15 am)
— Water level = +7.8' above M.L.W. at 8:15 am (±)

SUBJECT	JOB NO.	BY	DATE	SHEET
FD-89-3	CO 036	VLM	7/3/89	3 OF 3

BORING DETAIL



* All depths referenced to M.L.W. = MEAN LOW WATER = 0.00

CORPS OF ENGINEERS, U. S. ARMY
NEW ENGLAND DIVISION
FOUNDATION AND MATERIALS BRANCH

FIELD LOG OF TEST BORING

PROJECT NO. CD 036

Site Cape Cod Canal — Page 1 of 4 Pages

Hole No. FD-89-4 Diam. (Casing) (NX) 3 in. — Boring Started 6/28/89 10:00 am

Co-ordinates: SEE BORING LOCATION PLAN — Boring Completed 6/28/89 11:45 am

Drilled by Atlantic Testing Laboratories, Limited
Randy Todd and Kevin Hawkins — Report Submitted

Purpose of Exploration To determine the character of sediment

Elevation Top of Hole -18.9' below M.L.W.
Total Overburden Drilled 16 Feet
Elevation Top of Water +5.6' above M.L.W.
Elevation Bottom of Hole -34.9' below M.L.W.
Total Rock Drilled 0.0 Feet
Total Depth of Hole 40.5 Feet
Core Recovered — %
Core Recovered — Ft.; — Diam. — In.
Soil Samples 1 3/8 In. Diam. 8 No.
Soil Samples — In. Diam. — No.

Casing Left in Place 0.0' Feet
Total Length of Casing 42.5 Feet
6 ft. of casing through barge
(see boring detail page 4)

Water Table Depth +5.6 ft. above MLW.
24.5 ft. above top of soils

Depth From	Depth To	Method of Drilling and Type of Bit Used
0.0'	14.0'	NX Casing, using water (3")
0.0'	16.0'	1 3/8" I.D. Standard Split Spoon Sampler
		with 140 lbs. Hammer

INDEX

Prepared by Vicky L. Murphy
Field Data — Lab. Data

Submitted by Atlantic Testing Laboratories, Ltd.

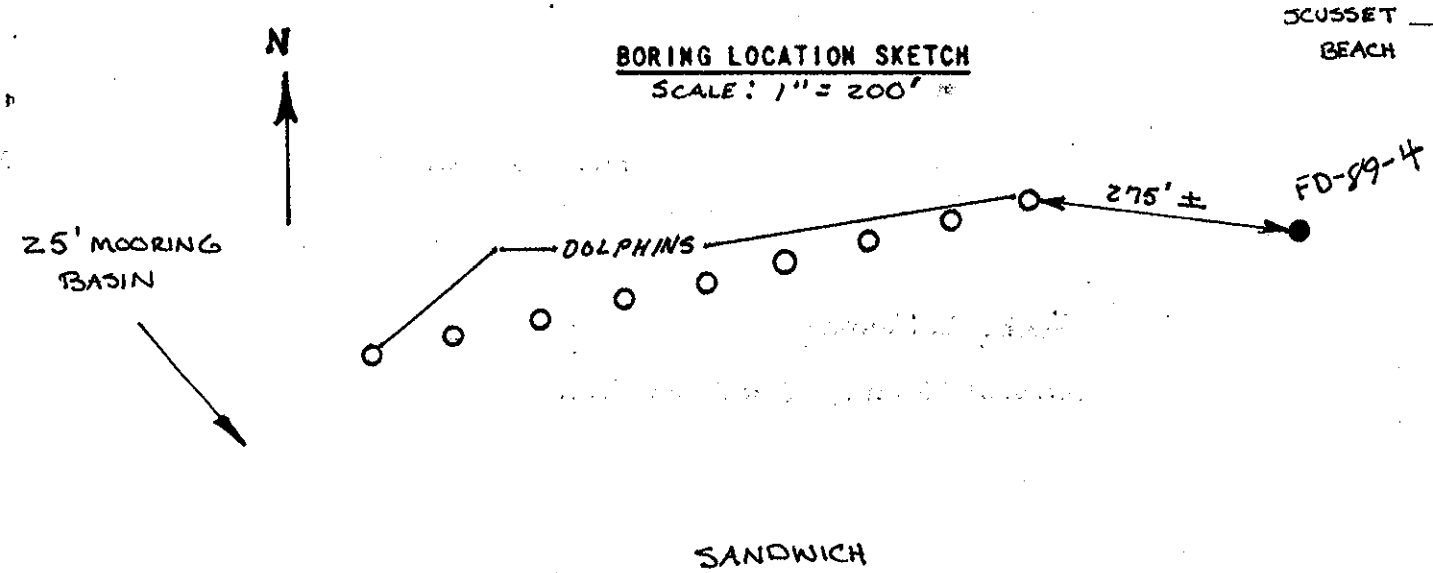
NED FORM DEC 63 121

REPLACES EDITION OF JUN 51 WHICH MAY BE USED UNTIL EXHAUSTED

GROUND WATER OBSERVATIONS

DATE	TIME	DEPTH-BOT. OF CASING	DEPTH-BOT. OF HOLE	DEPTH TO WATER	ELEVATION WATER	REMARKS
6/28	10:00 am	-32.9 ft. below M.L.W.	-34.9 ft. below M.L.W.	0.0 ft.	+5-6 ft. above M.L.W.	The tide was falling as drilling progressed
AVERAGE GROUND WATER ELEVATION _____						

Note: Depths are in feet below M.L.W. – Mean Low Water



U. S. ARMY
CORPS OF ENGINEERS
NEW ENGLAND DIVISION

FIELD LOG OF TEST BORING

Site CAPE COD CANAL — Page 2 of 4 Pages

Boring No. FD-89-4 Desig. ____ Diam. (Casing) 3 in.

Co-ordinates: SEE BORING LOCATION PLAN

Elevation Top of Boring -18.9' below M.L.W.
Total Overburden Drilled 16 Feet
Elevation Top of Water +5.6' above M.L.W.
Total Rock Drilled 0.0 Feet
Elevation Bottom of Boring -34.9' below M.L.W.
Total Depth of Boring 40.5 Feet
Core Recovered — % No. Boxes —
Core Recovered — Ft : — Diam. — In.
Soil Samples 1 3/8 In. Diam. 8 No.
Soil Samples ____ In. Diam. ____ No.

Hammer Wt. 140 lbs. Boring Started 6/28/89
Hammer Drop 30 in. Boring Completed 6/28/89
Casing Left 0.0 ft.
Surface Water Data: Back of Page 1
Obs. Well —
Drilled By Randy Todd and Kevin Hawkins
Mfg. Des. Drill CME 45
Inspected By: Vicky L. Murphy
Classification By: Vicky L. Murphy
Classification By: ____

DEPTH (ft)	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT. CORE REC'VY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	1	1 3/8"	2'	W.O.H. 2 2 2	Sampled with 1 3/8" I.D. spoon with 140 lbs. hammer	Dark Grey mf+ SAND; little SILT (s,np) Recovery = 10" = 42%
	2	1 3/8"	4'	7 6 9 7	Spun 3" casing 6 ft. through barge, 24.5 ft. through water and 2 ft. through soils to 26.5 ft. below existing water level (-20.9' below MLW) Sampled with 1 3/8" I.D. spoon with 140 lbs. hammer	Dark Grey mf+ SAND; little SILT (s,np) Recovery = 10" = 42%
	3	1 3/8"	6'	4 3 5 5	Spun 3" casing 2 ft. through soils to 28.5 ft. below existing water level (-22.9 ft. below MLW) Sampled with 1 3/8" I.D. spoon with 140 lbs. hammer	Grey mf+ SAND; little SILT (s,np) Recovery = 18" (75%)
	4	1 3/8"	8'	9 17 47 51	Spun 3" casing 2 ft. through soils to 30.5 ft. below existing water level (-24.9 ft. below MLW) Sampled with 1 3/8" I.D. spoon with 140 lbs. hammer.	Grey mf + SAND; little SILT; trace m GRAVEL (s,np) Recovery = 24" = 100%
	5	1 3/8"	10'	19	Spun 3" casing 2 ft. through soils to 32.5 ft. below existing water level (-26.9 ft. below MLW.) Sampled with 1 3/8" I.D. spoon with 140 lbs. hammer.	Grey f SAND; some SILT (s,np) Recovery = 24"

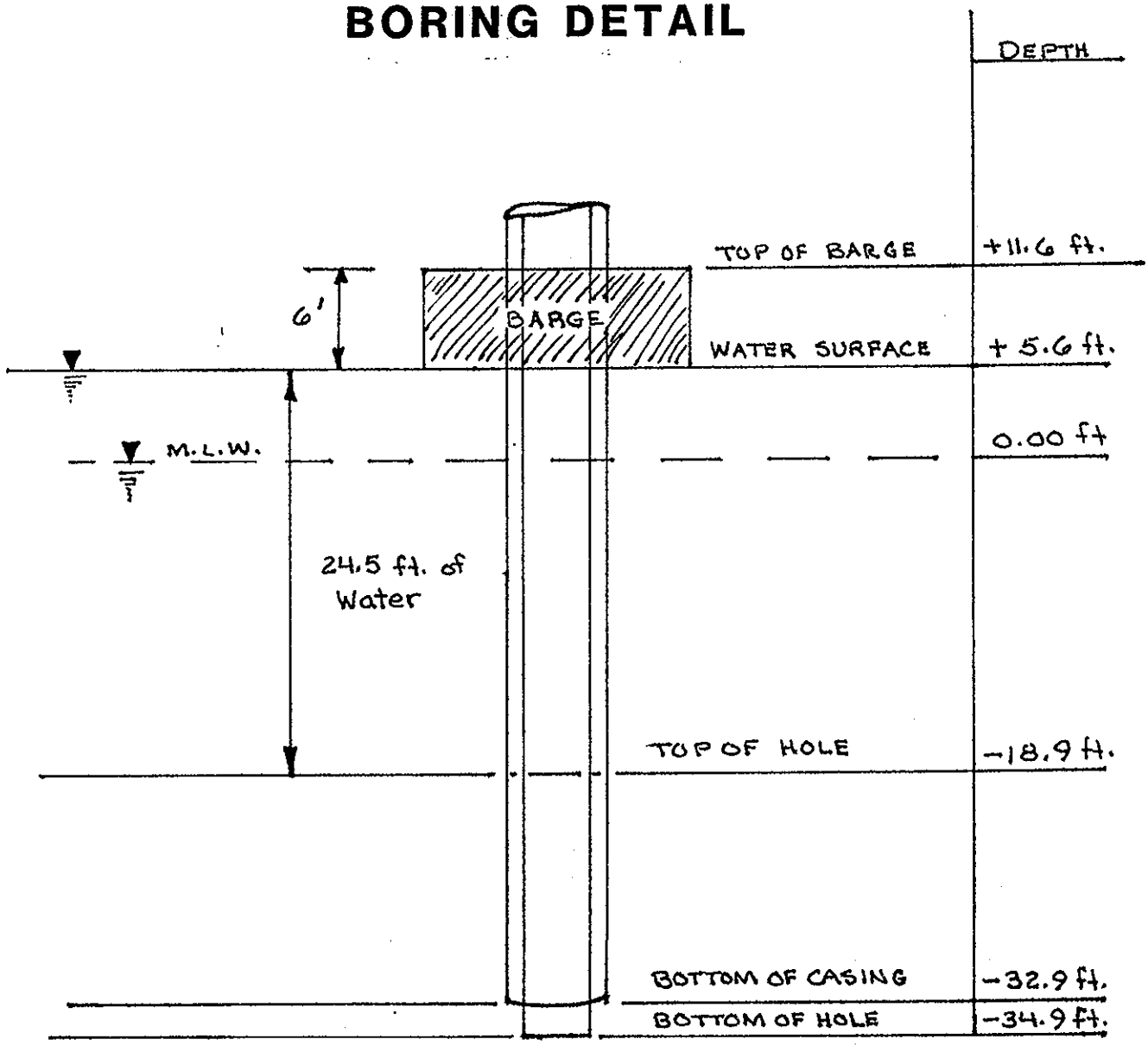
GENERAL REMARKS: W.O.H. - Weight of Hammer
M.L.W. - Mean Low Water
24.5 ft. of water above top of hole at start (10:00 a.m.)
Water Level = +5.6' above M.L.W. at 10:00 am

Site CAPE COD CANAL | Boring No. FD-89-4 | Page 3 of 4

DEPTH (ft)	CORE/SAMPLE NO.	SIZE	DEPTH RANGE	BLOWS PER FT / CORE RECVY	SAMPLING AND CORING OPERATIONS	CLASSIFICATION OF MATERIALS
	6	1 3/8"	12'	8 8 13 16	Spun 3" casing 2 ft. through soils to 34.5 ft. below existing water level (-28.9 ft below M.L.W.) Sampled with 1 3/8" I.D. spoon with 140 lbs. hammer. (-30.9 ft. below M.L.W.)	Grey f SAND; some SILT (s,np) Recovery = 18" = 75%
	7	1 3/8"	14'	13 15 13 14	Spun 3" casing 2 ft. through soils to 36.5 ft. below existing water level (-30.9 ft. below M.L.W.) Sampled with 1 3/8" I.D. spoon with 140 lbs. hammer (-32.9 ft. below M.L.W.)	Grey f SAND; some SILT (s,np). Recovery = 18" = 75%
	8	1 3/8"	16'		Spun 3" casing 2 ft. through soils to 38.5 ft. below existing water level (-32.9 ft below MLW) Sampled with 1 3/8" I.D. spoon with 140 lbs. hammer (-34.9 ft. below MLW)	Grey f SAND; some SILT. (s,np) Recovery = 24" = 100%

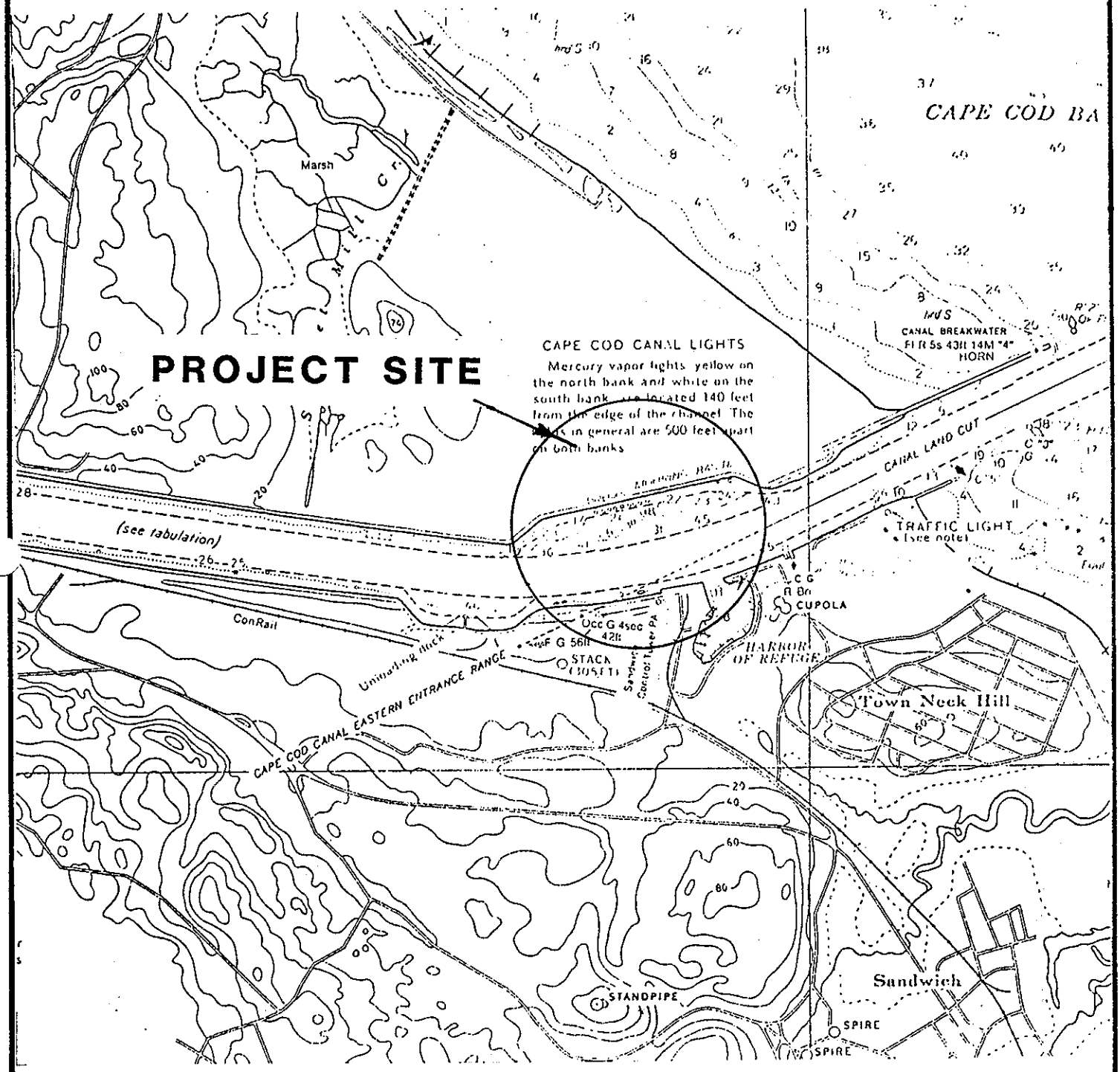
SUBJECT	JOB NO.	BY	DATE	SHEET
FD-89-4	CD 036	VLM	7/6/89	4 of 4

BORING DETAIL

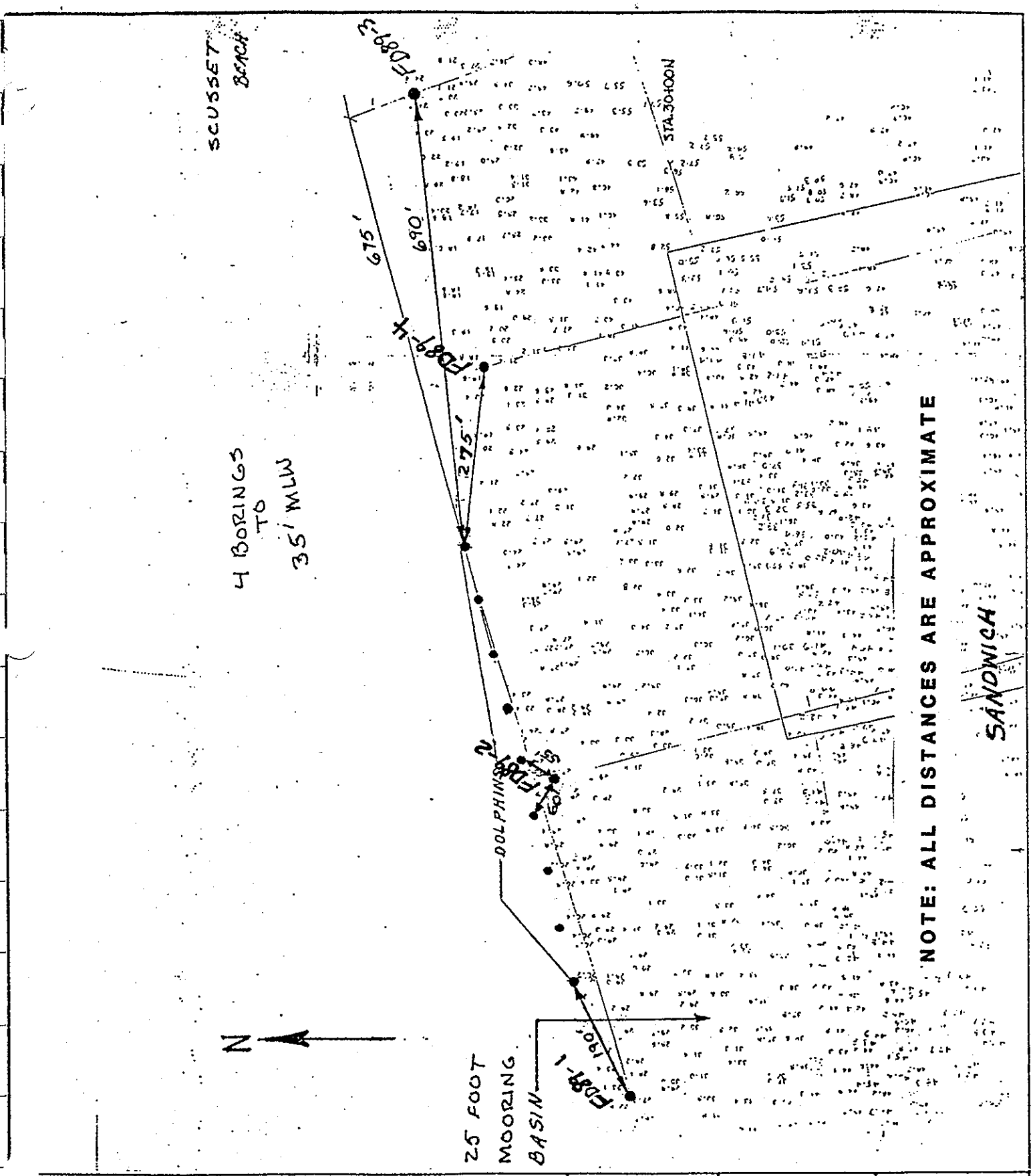


* All depths referenced to M.L.W. = Mean Low Water = 0.00 ft.

SITE LOCATION MAP



PROJECT No.		U.S.G.S. QUADRANT:
CD 036		Sagamore



BORING LOCATION PLAN	SCALE 1" = 200'	PROJECT No. CD036	DATE 6/30/89
CAPE COD CANAL, MA	ATLANTIC TESTING LABORATORIES, Limited CANTON NY CICERO NY ENDICOTT NY BURLINGTON VT UTICA NY MANCHESTER NH		

D-5A